

Remarks

Entry of the foregoing and reconsideration of the application identified in caption as amended, pursuant to and consistent with the Rules of Practice in Patent Cases, and in light of the remarks which follow, is respectfully requested.

By the present amendment, claim 1 has been amended and new claim 26 has been presented for consideration, so that claims 1-19, 24, and 26 will be pending upon entry of the present amendment.

Claim 1 stands objected to for lacking sufficient antecedent basis for the recitation of "the surface", which has been amended to read "a surface." Withdrawal of the record objection is respectfully requested.

Claims 1-6, 8, 9, 11, 16, 17, and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,265,202 to Cornell. ("Cornell"). This rejection is respectfully traversed.

The Examiner has expressed the view that Cornell discloses a flexible dental polymer film considered to anticipate the subject matter of present claim 1. However, the flexible dental polymer film of claim 1 is clearly distinguishable from the disclosure of Cornell for at least the following reasons.

It has previously been pointed out that a common dictionary defines the ordinary meaning of the term "film" as "a thin skin or membrane." In this context, numerous passages of the present specification have been identified which clearly support and are consistent with this interpretation.

For example, page 11, lines 12 to 16 and lines 30 to 32, state that a particular side of the film is preferably coated with various materials. Page 12, lines 25 to 30, state that the polymer film has elasticity and plastic formability. Page 13, lines 1 to 21, state that the film can have several layers and can take the form of pre-produced oval film pieces, which are directly applied to the tooth. Page 14, lines 16 to 21, describe the invention as a flexible polymer film that can be fixed to the tooth surface. Page 15, lines 1 to 21, describe the film being fitted to the tooth surface by shaping. Page 17, lines 1 to 10, describe the making and handling of the flexible polymer film of the present invention and further cutting of the polymer film to the desired dimensions.

In view of the above-mentioned properties, the flexible dental polymer film of claim 1 is clearly understood by one of skill in the art reading the specification to refer to a thin solid

skin or membrane of polymer. A person of ordinary skill in the art will understand that a polymer film or membrane is generally characterized by a certain structural stability and mechanical strength. More particularly, a polymer film or membrane will be understood to have a certain degree of strength within the plane of the film while being flexible in perpendicular directions. In terms of molecular structure, polymer films are generally characterized by the presence of a continuous polymer network made up of polymer molecules overlapping with one another and substantially aligned in the plane of the film to provide the polymer film with the mechanical properties mentioned above.

The presence of a polymer network in the polymer film or membrane according to the invention is further clearly supported by the specification. Specifically, on page 4, line 24 to page 5, line 3, various examples are disclosed of how the flexible dental polymer film according to the invention is provided by polymerization of monomers. The described polymerizations clearly result in the formation of polymer networks as described above. The same applies to the production of polymer films as described in the specific examples of the present application.

Cornell discloses a putty composition made of solid finely divided methyl methacrylate filler which is intimately dispersed with a liquid dimethacrylate ester monomer in proportions to make a putty consistency (see Cornell, column 1, lines 18-61 as well as claim 1). Thus, the putty material according to Cornell is a dispersion of isolated polymer particles in a continuous liquid phase of monomer molecules.

It is noted that contrary to the Examiner's opinion, the monomeric methacrylate ester of Cornell is not a Michael addition resin. In fact, as a monomeric compound this ester is not a resin at all. Furthermore, the putty material according to Cornell obviously has no continuous covalent network of polymer molecules which could provide this material with any significant strength or structural stability. Rather, the putty material will be recognized to have free plastic formability in any direction.

In view of the above, the subject matter of claim 1 differs from the disclosure of Cornell at least in that it relates to a flexible film or membrane having a certain degree of strength within the plane of the film instead of a putty material having free plastic formability in any direction. Consequently, the subject matter of claim 1 is clearly novel over the disclosure of Cornell.

Moreover, the subject matter of claim 1 is not obvious in view of Cornell. The problems which the present inventors solved relates to coating tooth surfaces and in particular for prevention or treatment of dental caries, which are distinct from the prior art which is directed to overcoming a lack of formability or poor adhesive properties.

The putty material disclosed by Cornell lacks a covalent network of polymer molecules and thus exhibits free plastic formability in any direction. Accordingly, even when this material is mounted on a polymer sheet it will obviously tend to yield to the local forces exerted during application and fitting to a tooth surface, thereby creating holes and breaks in the coating layer thus prepared. Such flaws in the coating layer are detrimental to its ability to protect the tooth against caries.

The above problems are unexpectedly solved by the flexible dental polymer film according to the invention. Thus, the film or membrane according to the invention can be easily applied and fitted to the curved surface of the tooth without the above-noted problems and further provides superior adhesion to the tooth surface.

More particularly, the flexible dental polymer film or membrane provides a number of unexpected advantages. On the one hand, the flexibility of the film provides for the best possible fit to the curved tooth surface. At the same time, due to its strength and structural stability the polymer film or membrane is able to withstand the forces applied during application and fitting to the tooth surface, and the integrity of the film is preserved without breaking the continuous film layer. Due to the polymerizable groups which it contains, the film can moreover produce covalent bonds to the tooth surface. Thus, the particular combination of properties of the flexible dental polymer film or membrane according to the invention allows for the provision of a well-fitted, continuous and well-adhered coating of the tooth surface, which is well-suited for prevention or treatment of caries.

Claims 2-6, 8, 9, 11, 16, 17, and 19 are directly or indirectly dependent on claim 1. Therefore, the subject matter of these claims is novel and inventive for the same reasons as discussed for claim 1.

The above reasoning also applies to the subject matter of new claim 26. Moreover, new claim 26 is directed to the flexible dental polymer film of claim 1 which is additionally elastic. Support for this additional feature is found in particular at least on page 12, lines 31-33 of the specification as filed.

The putty material according to Cornell clearly is not elastic. There is no disclosure of elastic properties of the putty material. In this context it is noted that the “elasticizing action,” which according to the disclosure in column 9, lines 38-44 of Cornell is attributed to certain vinyl aromatic monomers optionally employed in the liquid monomer phase of the putty material, clearly relates to a property of the final polymer rather than the putty material itself. Thus, even incorporation of the aromatic monomers into the putty material according to Cornell would not result in an elastic polymer material capable of further polymerization.

Furthermore, elasticity is commonly understood as the capability of recovering size and shape after deformation. As such, elasticity requires the presence of intermolecular forces which are able to recover the original size and shape and thus revert the action of a deforming force after such force has been removed. As shown above, no such intermolecular forces are present in the putty material according to Cornell. Therefore, a person of ordinary skill in the art will realize that the putty material disclosed by Cornell cannot be elastic.

Consequently, the subject matter of new claim 26 is novel over the disclosure of Cornell. Moreover, Cornell does not provide any teaching or motivation to use an elastic polymer film instead of the disclosed putty material. Therefore, the subject matter of new claim 26 is not obvious in view of the prior art.

Withdrawal of the record rejection of claims 1-6, 8, 9, 11, 16, 17, 19, and 24 under 35 U.S.C. § 102(b) as being anticipated by Cornell and allowance of said claims is respectfully requested.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being obvious over Cornell in view of U.S. Patent No. 5,154,762 to Mitra et al. (“Mitra”). This rejection is respectfully traversed.

Mitra is relied upon for the disclosure of an initiator in microencapsulated form. However, as set forth in detail above, Cornell lacks a teaching or suggestion of the dental polymer film of present claim 1. In particular, none of the cited documents provides any teaching or motivation to use a flexible dental polymer film or membrane comprising polymerizable groups capable of further polymerization. Therefore, the subject matter of claim 7 is not rendered obvious by the teachings of Cornell in combination with Mitra.

Claim 7 is patentable for at least the reasons that claim 1 from which it depends is patentable.

Withdrawal of the record rejection of claim 7 under 35 U.S.C. § 103(a) as being obvious over Cornell in view of Mitra and allowance of claim 7 is respectfully requested.

Claims 10, 12, 13, and 24 stand rejected under 35 U.S.C. § 103(a) as being obvious over Cornell in view of U.S. Patent No. 6,039,569 to Prasad et al. (“Prasad”). This rejection is respectfully traversed.

The Prasad disclosure is cited for teaching a dental polymer film having an antioxidant, a primer, and an adhesive. However, as set forth in detail above, Cornell lacks a teaching or suggestion of the dental polymer film of present claim 1. In particular, none of the cited documents provides any teaching or motivation to use a flexible dental polymer film or membrane comprising polymerizable groups capable of further polymerization. Therefore, the subject matter of claims 10, 12, 13, and 24 is not rendered obvious by the teachings of Cornell in combination with Prasad. These claims are patentable for at least the reasons that claim 1 from which they depend is patentable.

Therefore, withdrawal of the record rejection of claims 10, 12, 13, and 24 under 35 U.S.C. § 103(a) as being obvious over Cornell in view of Mitra and allowance of said claims is respectfully requested.

Claims 14 and 15 stand rejected under 35 U.S.C. § 103(a) as being obvious over Cornell in view of U.S. Patent No. 6,197,410 to Vallittu et al. (“Vallittu”). This rejection is respectfully traversed.

The Examiner contends that it would have been obvious to coat one side of the material of Vallittu with an anti-adhesive. However, as set forth in detail above, Cornell lacks a teaching or suggestion of the dental polymer film of present claim 1. In particular, none of the cited documents provides any teaching or motivation to use a flexible dental polymer film or membrane comprising polymerizable groups capable of further polymerization. Thus, claims 14 and 15 depend from claim 1 and are not obvious in view of the teachings of Cornell in view of Vallittu for at least the reasons noted above with respect to claim 1.

Withdrawal of the record rejection of claims 14 and 15 under 35 U.S.C. § 103(a) as being obvious over Cornell in view of Vallittu and allowance of said claims is respectfully requested.

Claim 18 stands rejected under 35 U.S.C. § 103(a) as being obvious over Cornell in view of Karazivan. This rejection is respectfully traversed.

The Examiner contends that Karazivan teaches a film detachably held on a carrier film in the form of an inflatable film bag and that it would have been obvious to modify the

film of Cornell having the carrier film of Karazivan in order to better adapt the dental film to the applied surface. However, as set forth in detail above, Cornell lacks a teaching or suggestion of the dental polymer film of present claim 1. In particular, none of the cited documents provides any teaching or motivation to use a flexible dental polymer film or membrane comprising polymerizable groups capable of further polymerization. Claim 18 depends from claim 1 and is not obvious in view of the teachings of Cornell in view of Karazivan for at least the reasons noted above with respect to claim 1.

Withdrawal of the record rejection of claim 18 under 35 U.S.C. § 103(a) as being obvious over Cornell in view of Karazivan and allowance of claim 18 is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is hereby earnestly solicited.

Respectfully submitted,

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